

# Notice of Allowability

Application No.

10/643,746

Examiner

James D. Stein

Applicant(s)

SUMMERS ET AL.

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to election filed on 7/13/05.
2. ☒ The allowed claim(s) is/are 11-20.
3. ☒ The drawings filed on 19 August 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 0805
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

James D. Stein  
Patent Examiner  
AU 2874

### **DETAILED ACTION**

This Office Action is in response to the election without traverse of claims 11-20 (group II) filed on 7/13/05. Claims 1-10 and 21-39 have been withdrawn.

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Bryan Bockhop on 8/22/05.

Part "b" of claim 11 has been amended to recite "phosphor" instead of "the phosphor".  
Part "c" of claim 11 has been amended to recite "nano-structure" instead of "nano-spheres".

In order to put the application in condition for allowance, claims 1-10 (Group I) and claims 21-39 (Group III) drawn to non-elected inventions have been cancelled.

### ***Allowable Subject Matter***

Claims 11-20 are allowed.

The following is an examiner's statement of reasons for allowance: None of the cited prior art discloses or suggests a method of making a photonic crystal comprising the steps of forcing a plurality of nano-structures and a plurality of defect structures into a lattice, thereby creating a plurality of interstitial spaces; repeatedly applying, through atomic layer deposition, a plurality of layers of a predetermined optical material to the plurality of nano-structures until the

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interstitial spaces are substantially filled with the phosphor; and subjecting the nano-structures to a reactant so as to remove the nano-spheres and form the photonic crystal.

Relevant prior art references, such as [USPUBS 2004/0062505] to Sugitatsu et al. and [USPUB2002/0123827] to Salerno et al., generally disclose methods of forming photonic crystal devices that employ atomic layer deposition. However, they fail to disclose the repeated use of atomic layer deposition in order to fill substantially the plurality of voids in the photonic crystal with phosphor. It would not have been obvious to modify the prior art in order to achieve this since applicant has discovered that the present configuration facilitates efficient absorption of photonic pump excitation, the transfer of the absorbed energy to an activator, and the efficient emission of radiation from the activator of appropriate frequency [¶0031].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

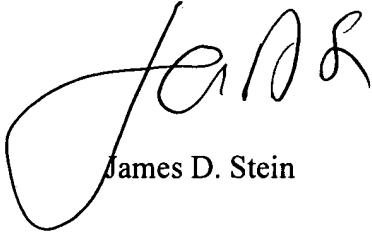
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Stein whose telephone number is (571) 272-2132. The examiner can normally be reached on M-F (8:00am-4:30pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James D. Stein



MICHELLE CONNELLY-CUSHWA  
PRIMARY EXAMINER  
8/24/05